A congruence-free semigroup associated with an infinite cardinal number

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Abstract

Let X be a set with infinite cardinality m and let Q_m be the semigroup of balanced elements in $T(X)$, as described by Howie. If I is the ideal $\{\alpha \in Q_m : |X\alpha| < m\}$ then the Rees factor $P_m = Q_m/I$ is $0-$bisimple and idempotent-generated. Its minimum non-trivial homomorphic image P_m^* has both these properties and is congruence-free. Moreover, P_m^* has depth 4, in the sense that $[E(P_m^*)]^4 = P_m^*$ and $[E(P_m^*)]^3 \neq P_m^*$.